

**ABSTRACT**

By this invention, a plant β -ketoacyl-CoA synthase condensing enzyme is provided free from intact cells of 5 said plant and capable of catalyzing the production of very long chain fatty acid molecules. Also contemplated are constructs comprising the nucleic acid sequence and a heterologous DNA sequence not naturally associated with the condensing enzyme encoding sequences, and which provide for 10 at least transcription of a plant condensing enzyme encoding sequence in a host cell. In this fashion very long chain fatty acid molecules may be produced in a plant cell. Included are methods of modifying the composition of very long chain fatty acid molecules in a plant cell.